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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/685,053	10/14/2003	William Arthur Welsh	S-5654	5716

7590 12/06/2005

Sikorsky Aircraft Corporation
Legal-IP Dept., Mail Stop S316A
6900 Main Street
Stratford, CT 06615-9129

EXAMINER	
NGUYEN, XUAN LAN T	

ART UNIT	PAPER NUMBER
3683	

DATE MAILED: 12/06/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary	Application No.	Applicant(s)	
	10/685,053	WELSH ET AL.	
	Examiner	**Art Unit**	
	Lan Nguyen	3683	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 September 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,2,4 and 11-28* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,4 and 11-28* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *22 September 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☒ Other: *approved drawings*.

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DETAILED ACTION

Drawings

1. The drawings were received on 9/22/05. These drawings are approved.

Specification

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. The amendment filed 2/16/05 is objected to under 35 U.S.C. 132(a) because it introduces new matter into the disclosure. 35 U.S.C. 132(a) states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows:

- In paragraph [00028], lines 9-18, the added portion starting with "The power source 60" and ending with "exactly track rotor speed".

Applicant is required to cancel the new matter in the reply to this Office Action.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. Claims 18, 24 and 28 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

- Re: claim 18, see the objection to new matters in the specification objections above.
- Re: claim 24, claimed limitation "reducing phase".
- Re: claim 28, see the objection to new matters in the specification objections above.

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 1, 2, 4, 19 and 21-23 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

- In claims 1 and 21, the term "selectively" renders the claims indefinite.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

> invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. Claims 1, 2, 4 and 11-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Case et al. in view of Hooper.

Re: claim 1, Case et al. show a vibration isolation system for reducing vibrations in a rotating system rotatable about an axis of rotation in figure 4, as in the present invention, comprising: a housing 62 mounted to said rotating system and defining an internal chamber 282; a Magneto Rheological Fluid (MRF) 284 disposed in said chamber, and means 290 for distributing said MRF within said chamber to form an eccentric mass which reduces a vibratory load active in said rotating system, as shown in figure 4. Case's housing 62 rotates with the shaft 20. Hooper teaches the concept of having the vibration isolation system 14 rotates independently of the rotating system 21 of the main rotor 12 in order to not only suppressing the vibration from the rotating system but also the vibration from external sources such as wind in column 2, lines 15-26. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Case's vibration isolation system such that the housing could rotate independently of the rotating system as taught by Hooper in order to not only suppressing the vibration from the rotating system but also the vibration from external sources.

Re: claims 2 and 4, Hooper further shows a drive system 30, 39 for driving the housing 28 at a rotational speed greater than the rotational speed of said rotating system using the calculation as claimed, in column 1, lines 27-35. Case shows electromagnets 290 disposed in combination with said housing 62 and adjacent said internal chamber 282 for rotating therewith; power source 72; and control system 42 as claimed.

Re: claim 11, Case et al. show a method for reducing vibrations in a rotating system, as in the present invention, comprising: enclosing a medium 284 of variable viscosity in a housing 62 connected to the rotating system 20; sensing a rotational speed of the rotating system as shown in figure 10, issuing a control signal responsive to the rotational speed, the control signal activating a means 290 to change the viscosity of the medium; and redistributing the medium within the housing to reduce vibratory loads in the rotating system. Case's housing 62 rotates with the shaft 20. Hooper teaches the concept of having the vibration isolation system 14 rotates faster than the rotating system 21 of the main rotor 12 in order to not only suppressing the vibration from the rotating system but also the vibration from external sources such as wind in column 2, lines 15-26. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Case's method for reducing vibration to include a housing that could rotate faster than the rotating system as taught by Hooper in order to not only suppressing the vibration from the rotating system but also the vibration from external sources.

Re: claim 12, Case et al. show a vibration isolation system for reducing vibrations in a rotating system which rotates about an axis of rotation in figure 4, as in the present invention, comprising: a housing 62 defining an internal chamber 282, said housing mounted to said rotating system 20 for rotation about said axis of rotation of the rotating system; a Magneto Rheological Fluid 284 (MRF) partially filling said internal chamber, see column 13, lines 39-42, and an electromagnetic field generation system 290 mounted adjacent said internal chamber to azimuthally vary a viscosity of said MRF and distribute said MRF within said internal chamber to reduce a vibratory load in said rotating system, as shown in figure 4. Case's housing 62 rotates with the shaft 20. Hooper teaches the concept of having the vibration isolation system 14 rotates independently of the rotating system 21 of the main rotor 12 in order to not only suppressing the vibration from the rotating system but also the vibration from external sources such as wind in column 2, lines 15-26. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Case's vibration isolation system such that the housing could rotate independently of the rotating system as taught by Hooper in order to not only suppressing the vibration from the rotating system but also the vibration from external sources.

Re: claims 13-15, in column 1, lines 30-35, Hooper teaches the rotational speed of the housing as claimed.

Re: claim 16, Hooper shows main rotor system 12.

Re: claim 17, Hooper shows drive system 30, 39.

Re: claim 18, Hooper shows that the speed of the housing is greater than the speed of the main rotating system hence the drive system has to be controlled accordingly.

Re: claim 19, Case shows vibration sensor 48 to feedback for the controlling scheme.

Re: claim 20, Case further shows multiple electromagnets 290.

10. Claims 21-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hooper in view of Case et al.

Re: claim 21, Hooper shows a helicopter rotor system 12 which rotates about an axis of rotation, comprising: a main rotor assembly 12 having an N number of blades which rotates about an axis of rotation at a rotational speed of 1P, such that said main rotor system produces NP vibrations, see column 1 lines 30-35; a housing 28 defining an internal chamber, said housing mounted to said main rotor assembly for rotation about said axis of rotation independent of said main rotor assembly as shown. Hooper uses a vibration isolation device with movable eccentric masses 50, 51, 53 and 54 to balance the shaft 21 in order to reduce vibration. Case et al. teach a vibration isolation device that also uses eccentric masses but without internal moving parts comprising: a housing 62 partially filling with an MR fluid 284, see column 13, lines 39-42; a sensor system 48, a control system 42 in communication with said sensor system, and an electromagnetic field generation system 290 mounted within said housing for rotation therewith and adjacent said internal chamber to azimuthally vary a viscosity of said MRF and distribute said MRF within said internal chamber to form an eccentric mass in response to said control system to reduce said vibrations, as shown in figure 4. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Hooper's helicopter with a vibration isolation device such as Case's in order to dampen a wide range of frequency at the same time reducing internal moving parts which in turn would reduce the overall weight of the device as taught by Case. Note that Hooper's helicopter as modified by Case's vibration isolator would have the same control scheme wherein the goal is to dampen out NP vibration as stated by Hooper in column 1, lines 30-35.

Re: claims 22 and 23, Hooper further shows drive system 30, 39 and the calculation in column 1, lines 30-35.

Re: claim 24, Hooper shows a method of reducing vibrations in a helicopter rotor system which rotates about an axis of rotation, as in the present invention, comprising the steps of: rotating a housing 28 mounted to a main rotor assembly 12 about the axis of rotation independent of the main rotor assembly, the housing having an internal chamber; and varying an electric motor speed of the drive 30, 39 that drives the housing to match the optimal load based upon controller commands. Hooper's method lacks a MRF dampener. Case teaches a method using an MRF dampener comprising: providing a housing 62 having an internal chamber 282; and at least partially filled with a Magneto Rheological Fluid (MRF); sensing a vibration by sensor 48 generated by the rotating assembly; varying an electromagnetic field about the internal chamber to azimuthally vary a viscosity of said MRF and distribute said MRF within said internal chamber to form an eccentric mass in response to said sensed vibration to reduce the vibration, as shown in figure 4. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Hooper's method of reducing vibration in a helicopter with the use of a vibration isolation device such as Case's in order to dampen a wide range of frequency at the same time reducing internal moving parts which in turn would reduce the overall weight of the device as taught by Case.

Re: claims 25 and 26, Case shows in figure 10 that the device can be controlled based on a predetermined schedule and a detected trend.

Re: claim 27, Case shows the eccentric mass.

Re: claim 28, Hooper teaches in column 1, lines 30-35 the typical vibration in a helicopter and in figure 3, drive system 30, 39 to drive the dampener to cancel out the frequencies.

Response to Arguments

11. Applicant's arguments filed 9/22/05 have been fully considered but they are not persuasive.

- Applicant's argument about the 112, 1st rejection regarding new matters of the amendment to paragraph [00028] is not persuasive since the cited paragraphs [00028], [00030] and [00023] do not support the newly added portion. The rejection is repeated above. Due to this deficiency, the rejections to claims 18, 24 and 28 remain as stated above.
- Applicant's argument about the term "selectively" being a broad relative term is not persuasive. The Examiner maintains that the term "selectively" is indefinite. The rejection is repeated above.
- Applicant's argument of the improper combination of Case in view of Hooper because modifying Case in view of Hooper would destroy the function of Case's apparatus. Case shows a vibration isolation system to reduce vibrations in a rotating system wherein the housing 62 is rotating with the shaft 20. Hooper

teaches that it is old and well known for a vibration isolation system in an aircraft to comprise a housing rotate independently of the rotating shaft in order to further reducing vibrations from winds, etc. because of the environment that the vibration isolation system has to work with. Case provides an effective vibration isolator. Hooper teaches that a vibration isolating system in an aircraft would have to take into account the external vibrations such as winds, etc.; and a well-known way to compensate for the external vibrations is to include a housing that rotates independently of the shaft. One of ordinary skill in the art of vibration isolation would recognize that Case's vibration isolator is an excellent apparatus to dampen vibration; and to be utilized in an aircraft, it would have to be modified with an independently rotating housing such as taught by Hooper in order to further dampening the external vibrations that would need to dampen in the environment of an aircraft. The modification does not destroy Case's apparatus; it simply enhances the ability of the apparatus to further dampen vibration in a different environment such as the aircraft of Hooper. The rejections are still deemed proper and are repeated above.

Conclusion

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lan Nguyen whose telephone number is (571) 272-7121. The examiner can normally be reached on M-F, 8 to 4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, James McClellan can be reached on (571) 272-6786. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Lan Nguyen
Primary Examiner
Art Unit 3683

Lan Nguyen 12/1/05

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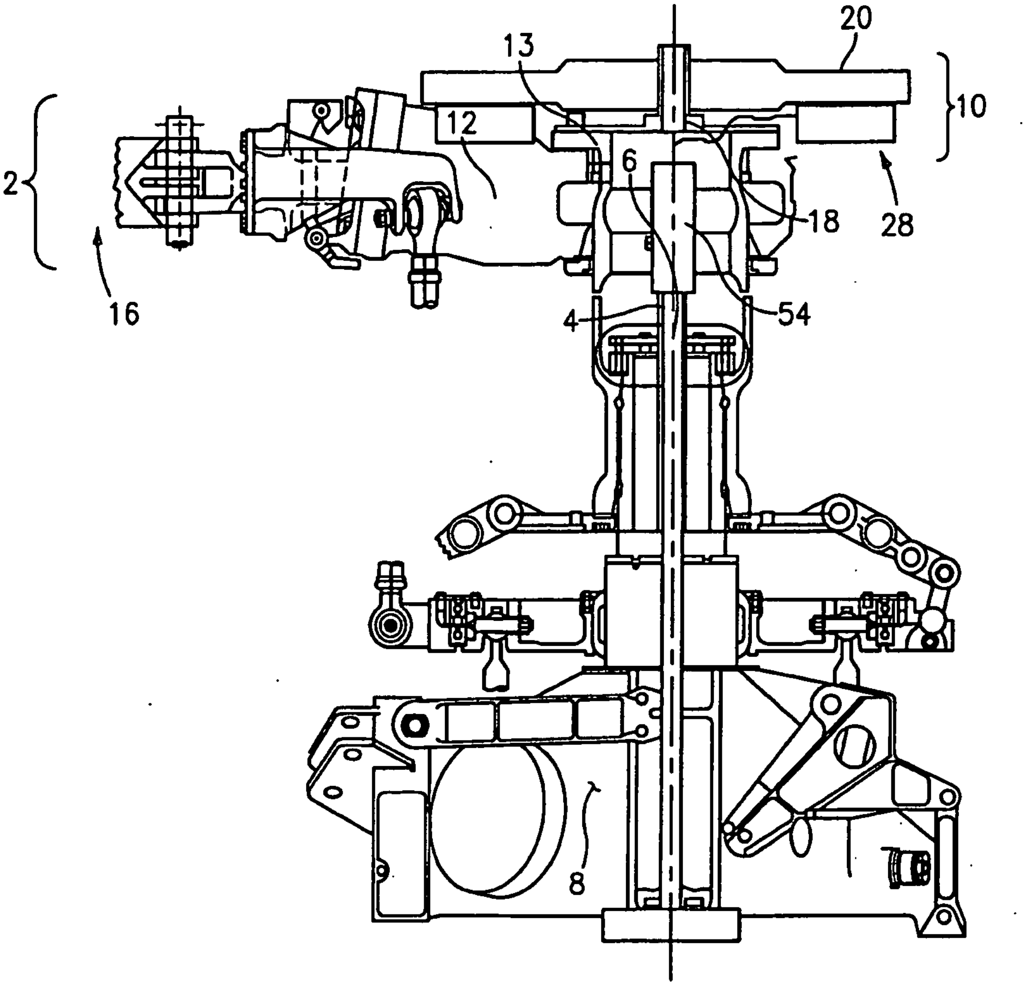

FIG. 2

approved
XLN
11/30/05

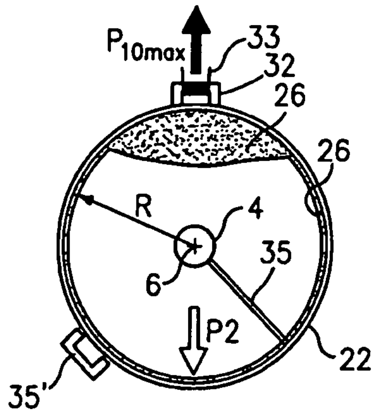

FIG. 3a

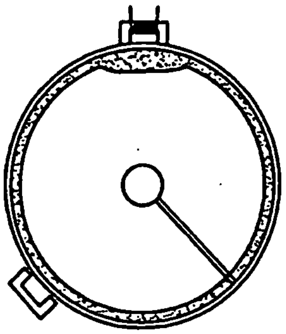

FIG. 3b

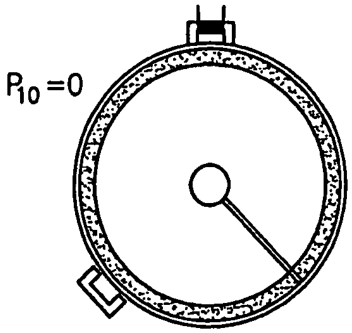

FIG. 3c

approved
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11/30/05

REPLACEMENT SHEET
Serial No. 10/685,053; Applicant: Welsh; Filing date: 10/14/2003
ACTIVE FORCE GENERATION/ISOLATION SYSTEM EMPLOYING
MAGNETO RHEOLOGICAL FLUID (MRF)

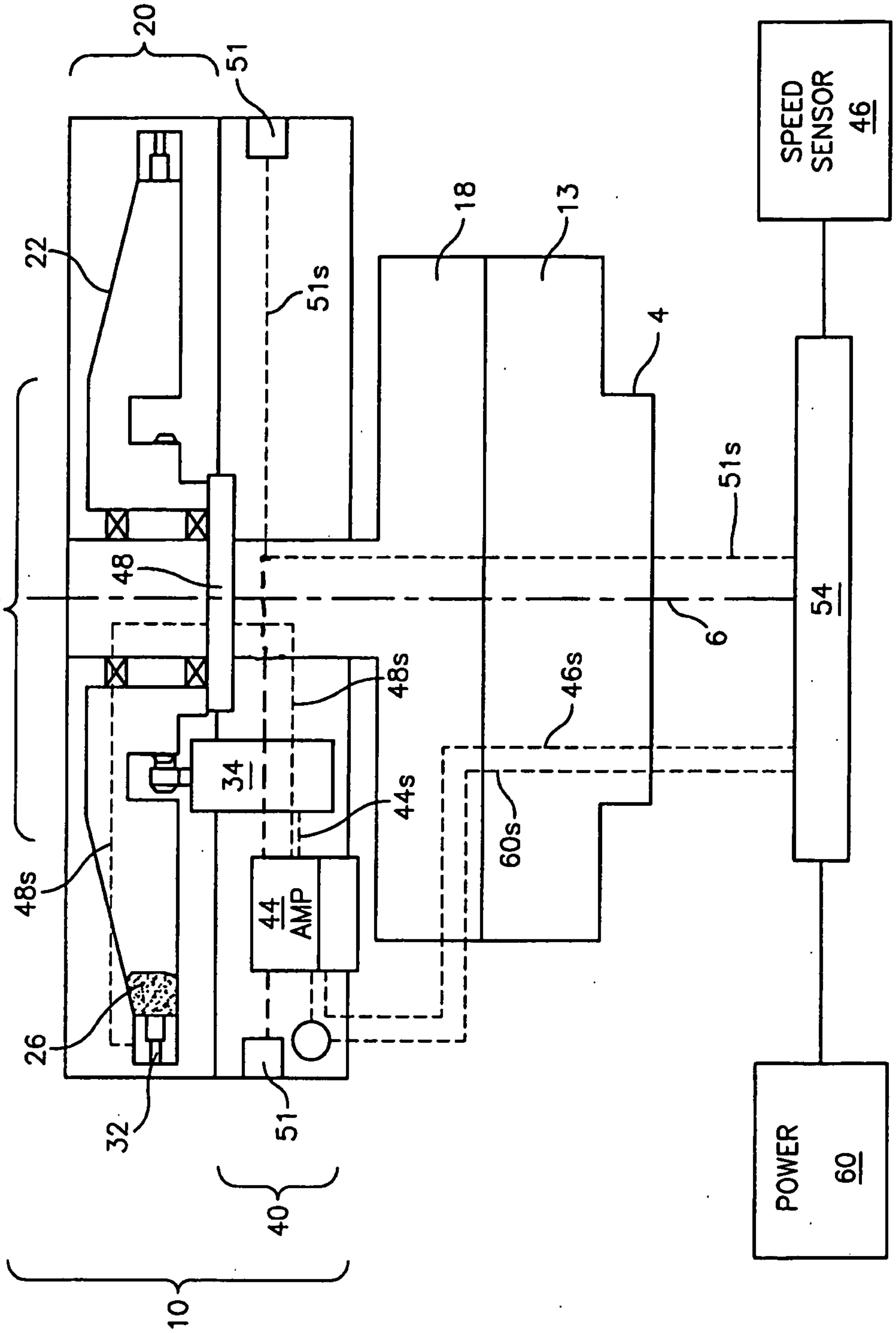

FIG. 4

approved
XLN
11/30/05

REPLACEMENT SHEET
Serial No. 10/685,053; Applicant: Welsh; Filing date: 10/14/2003
ACTIVE FORCE GENERATION/ISOLATION SYSTEM EMPLOYING
MAGNETO RHEOLOGICAL FLUID (MRF)

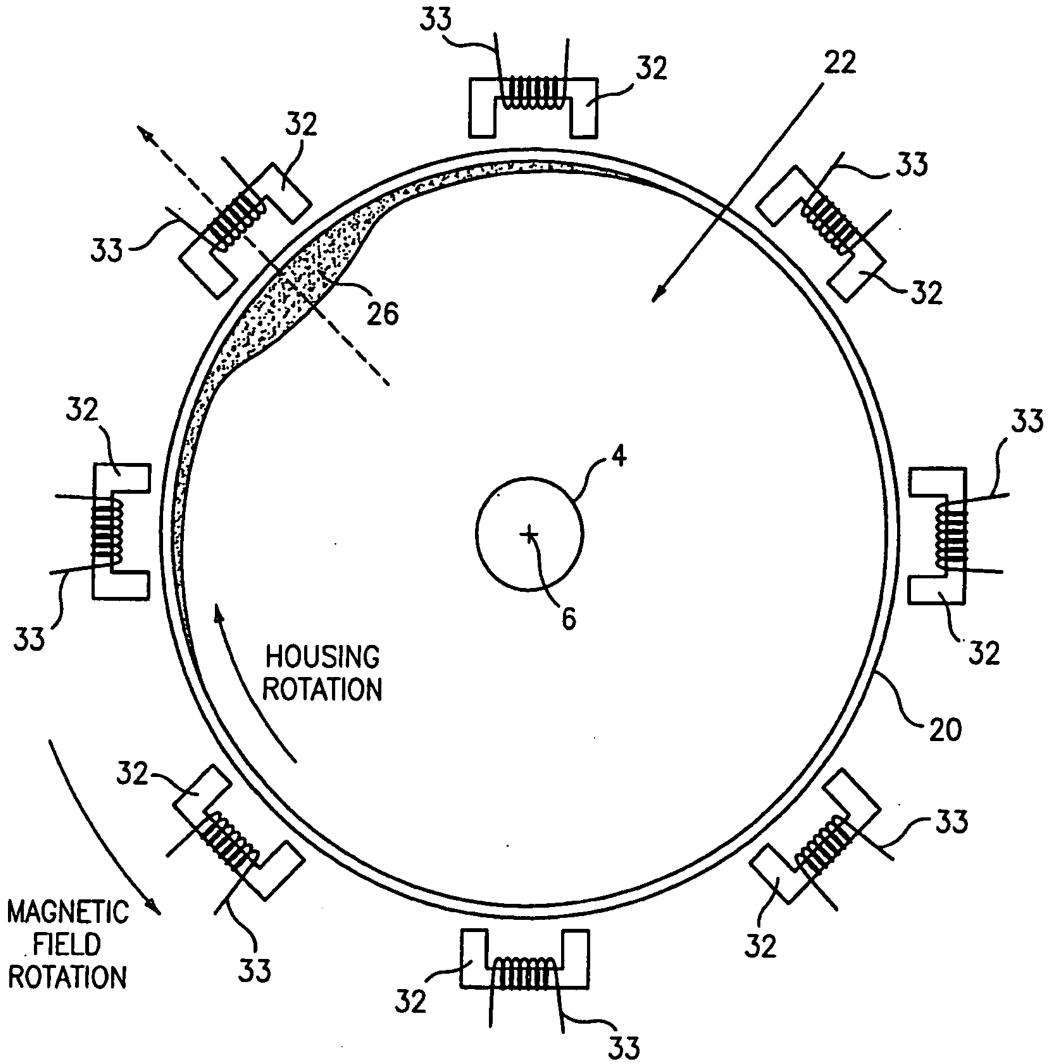

FIG. 5

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11/30/05